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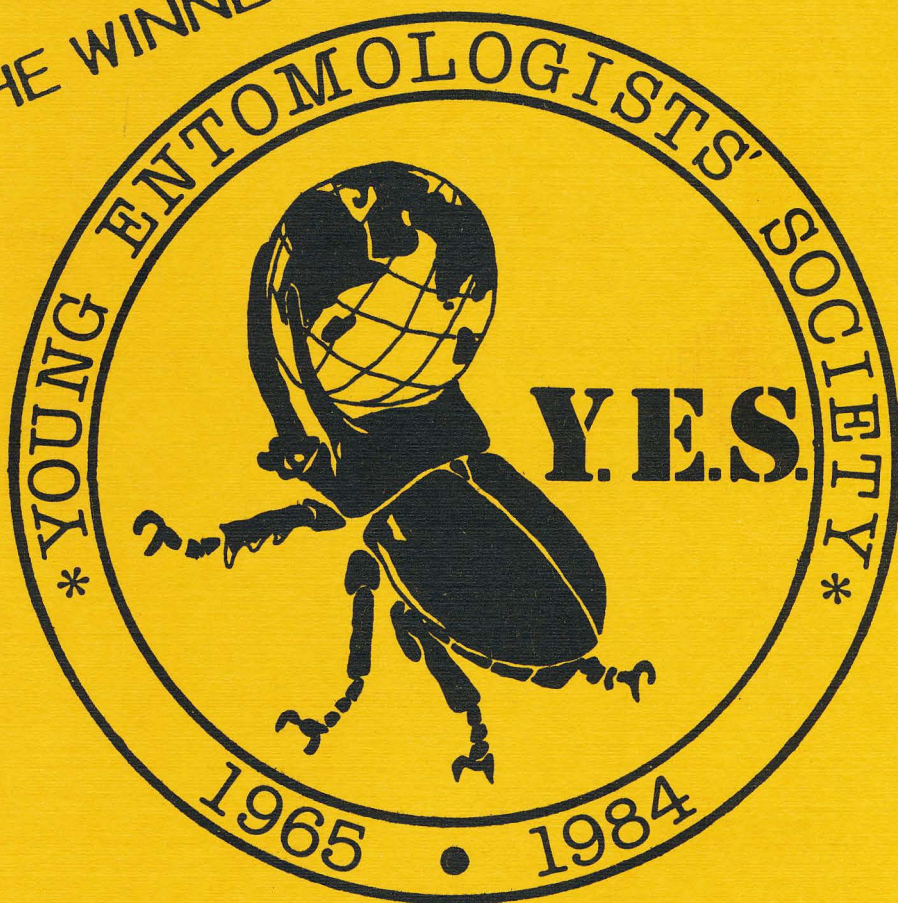
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# Y.E.S. QUARTERLY

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**Y.E.S. Quarterly**  
Vol. 1. No. 4

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## THE BEGINNING

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Suspense weighed heavy in the air. There we were, sitting around the table, hardly breathing, just waiting for it to happen. The four of us--my mother, my father, my brother, and myself--had been expecting it to happen for quite some time. And still we waited. No, we weren't waiting for a storm to hit; we were waiting for a butterfly to "hatch."

I was four years old, and my brother was three years old when we moved into our house in the country. Our parents took us for walks in the meadow, and one day we found a caterpillar on a milkweed plant. Assuring us that it was a "good bug," our parents brought it home so we could watch it develop.

It grew fast, and soon formed a bright green chrysalis. After that, it didn't move around and thus was not very interesting. One morning, however, it had turned black! "Is it dead?" my brother and I asked. "No," we were told, "it is getting ready to hatch." "Hatch? Into what? How can that black thing turn into a butterfly?" we wondered. We were told to watch.

And so began our wait. It seemed like an eternity, but was really about an hour. Suddenly, there was a small crackling sound like plastic breaking. Two narrow cracks appeared on the chrysalis, and two fragile legs reached out of the shell. As it brought its head upwards, it carefully pulled its wings and body out of its shell. Its two back legs remained in the shell, holding on like a vise.

"Its wings are too small; it can never fly with those!" But even as we watched, its wings began to expand as its body pumped fluid into them. The butterfly swayed slowly from side to side until its wings were full-sized, which took only a few minutes. After two hours had passed, its wings were dry, so we took the butterfly outside. It flew around us as if to say good-bye, then flew out over the meadow toward some flowers.

We had witnessed a miracle! I knew in that moment that I would continue to raise Monarchs and watch the miracle of their tiny lives unfold.

## REARING ATACUS ATLAS FORMOSANUS

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The date is May 15, 1983. Today in the mail I received a shipment of one dozen ova that I had ordered from a dealer the week before. The ova belong to perhaps the most famous of all Saturniidae moths--Attacus atlas formosanus--the Atlas moth, a native of Formosa, Republic of China. The ova came in a regular mailing envelope (3 5/8" x 6 1/2"). They were wrapped in a small piece of toilet paper that was placed into a bottle cap and then covered with tin foil.

Upon receipt of the ova, I carefully opened the small package. What followed was a series of surprises. The first surprise was the size of the ova--almost 2 1/2 mm in diameter each! They were cream-colored with purple-brown stains. The next surprise was that they had already begun hatching! One of the young larva was crawling around and two more were halfway out of the eggshell. Luckily, I was prepared.

I had built a cage for them (23" x 13 1/2" x 33"). Next, since I was planning on rearing the larvae indoors, I had brought into the house a branch of what I was going to use as a foodplant--lilac (Formosanus will also accept ash, sassafras, privet, ailanthus, cherry, rhododendron, mountain laurel, apple, and willow). I placed this in a vase of water and set it in the cage in the room I was going to rear them in. Due to the warmth of the house, the buds on the branch bloomed, providing plenty of food for the larvae. Within three days, eight of the caterpillars had hatched and been transferred to the lilac. The remaining four eggs never hatched. The eight larvae immediately started feeding and to prevent further deaths, I plugged up the opening of the vase around the branch with thick cotton so that they wouldn't walk down the branch and drown in the water (a habit unfortunately caterpillars love doing).

The young larvae are yellowish-white and are covered with rows of spines. Their color very much resembles the color of a newly hatched Callosamia promethea larva. For the first month the caterpillars appear to eat little, but as they grow larger they eat more. At first, food needs to be placed every two weeks (since the plant is in water it is always fresh), but as time goes on food has to be replaced every other day.

The larvae of Atlas moths are fat and are translucent blue-green and they have freckles of the same color but darker on the segments behind the head, on the legs, on the claspers, and

on the lower sides of the body. After each molt, the caterpillar covers its body with a white powder. This powder hides the true color of the larvae but it wears off before the next molt (or at least most of it) as it is loosely put on the body, especially near the spines. If a branch that a caterpillar was on was jolted, there would be like a miniature snowstorm under the caterpillar as the powder fell. In the final instar the caterpillar, fully stretched, is over seven inches long! It is covered with the bright white powder and the segments on the body are deeply indented.

The caterpillars started feeding on May 15 and the first cocoon was made on July 15, 1983. The caterpillars were so large before pupation that when they walked to the ends of the branches, the branches would bend down. The cocoons, when made, are wrapped in at least one leaf, which is attached to the branch by a strong peduncle. The cocoon is tan in color and egg shaped (about the size of a chicken egg!). There is an evident escape valve at the top of the cocoon like those found on Hyalophora cecropia cocoons. They are very tough and very heavy.

The pupation period lasted about a month and during the week of August 19 all eight adult moths hatched. I still find it unbelievable how the moth gets its fat body (even fatter at hatching because it is filled with the fluid for the wings) out of the tiny escape valve. The wet, wrinkled wings are about five inches long, and it takes about thirty minutes for them to be fully expanded and another thirty minutes to be dried. After raising the moths for four months from egg to adult, I became attached to the creatures. I didn't want to dispatch them. But, I wanted an A1 pair for my collection so I chose the largest male and female (which, by the way, are the largest I've ever seen--the male being nine inches across and the female being eight inches across). The remaining six moths I allowed to live out their natural lives, loose, in my bedroom.

One of the greatest experiences I have ever had in my years of collecting has been the rearing of Attacus atlas formosanus. There is nothing quite like the experience of having a live Atlas moth crawl up your shirt or sit on your hand. There is nothing comparable to the sight of an Atlas moth in flight (except maybe the flight of Argema mittrei--which someday I also hope to rear); they look like giant bats! But all good things must come to an end--as did the Atlas moths. When they finally died about a week later there was nothing left to the wings--the only way they could be identified was by their red-and-white striped bodies and bright orange antennae. Now all that is left are the happy memories--until I decide to rear them again.

## FINDING ORB WEAVER SPIDERS (ARANEIDAE)

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Have you ever considered collecting orb weaving spiders? Many of the orb weavers are very colorful spiders, like Argiope aurantia the very common black and yellow garden spider. They appear in the northern states at the beginning of August and are gone by the first of September. They can be found in open fields with tall grass, as well as in gardens. The carapace is covered with silvery hairs, and the abdomen is slightly pointed behind, marked in black and yellow (or orange).

Argiope trifasciata, the banded garden spider, comes out the same time as the other garden spiders, but can be found until the end of September. The webs are found in tall grass in the open sun and are parallel to the ground. This spider is pale yellow with numerous thin silvery and yellow transverse lines alternating with black on the abdomen.

Araneus trifolium, the shamrock spider, can be found from August to the beginning of October. It is common in open fields and low shrubs where it hides under folded leaves leading to its web. The legs are black-and-white striped (sometimes orange and white striped) and the abdomen may be pale green, or brown, grey, or even purplish-red, and it is marked with white spots.

Another spider, which I think is the most handsome, is Araneus marmoreus, the marbled spider. This spider is harder to find than the others. It builds its web in shrubs in shady places. I find them mostly along fire trails through the woods. The abdomen is yellow-orange with brown or purple markings in a consistent pattern, with orange-and-white striped legs and a white carapace. It appears from August to October in Pennsylvania.

## CONSERVATION—A MUST

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I have been collecting lepidoptera for over seven years now and have noticed a drastic decline in the number of specimens available, especially in the past three years. In these past three years I noticed something else also—more and more land is being developed. In my neighborhood (about a two-block area), there was once six areas that were untouched and lush with vegetation and an abundance of insect specimens. Now, three years later, all but two are gone—replaced by houses, a grocery store parking lot, condominiums, and one is cut for no apparent reason. All of these places were favorite collecting spots of mine, whose value I didn't realize until they were gone.

The area with the houses was once an overgrown field filled with milkweed, thistle, clover, goldenrod, and dozens of other wild flowers and plants. The area with the grocery store parking lot was very interesting—half was lush with plants and the rest was desert-like with lots of sand and rocks. In the center was parked an abandoned trailer truck, which provided shade on hot collecting days. The common plants were milkweed, snapdragon, honeysuckle, and some small trees and shrubs which, to this day, I haven't been able to identify.

The area with the condominiums was perhaps the best collecting place in Jamestown—a combination swamp and woods. The entire area was lined with pussywillows and there was also plenty of thistle, milkweed, goldenrod, dandelion, clover, and nettle.

Finally, the vacant lot which was mown sometimes had grass over three feet high! Plus, there used to be plenty of milkweed, wild roses, sassafras, clover, and other plants and flowers that butterflies thrive on.

All four of these places used to yield dozens of Papilio polyxenes, P. troilus, P. glaucus, Colias eurytheme, C. philodice, C. interior, Pieris rapae, Danaus plexippus, Euptychia cymela, Cercyonis pegala, Speyeria cybele, Euphydryas phaeton, Phyciodes tharos, Polygonia interrogationis, P. comma, Junonia coenia, Vanessa cardui, V. atalanta, V. virginiensis, Nymphalis j-album, N. antiopa, Limenitis archippus, L. astyanax, Lycaena hypophlaeas, Everes comyntas, Celastrina argiolus pseudargiolus, Harkenclenus titus, Celastrina ladon, Epargyreus clarus, and Pyrgus communis.

Today these are rare. Because of this I made a decision--to stop taking from the environment and to start giving. Since I made that decision I have been doing two things--rearing and planting.

The first problem I had in making this decision was making a commitment, because I was still a collector at heart and I wanted to continue building up my collection. I had to find a way to provide insects both for my collection and the environment. I finally decided on rearing specimens. Of the hundreds of specimens I may rear I would only keep two pairs (to display upper and under sides) and any aberrations that may occur (so far I have only had one aberration--a male Danus plexippus with a yellow instead of an orange-brown right forewing). Everything else is released into the wild, providing it is indigenous to Rhode Island. If possible, I breed the specimens beforehand--some eggs of which I keep to rear new specimens and the rest I leave up to the female adult to take care of. I supervised some larvae to hopefully provide a successful maturation. Others, I release into the wild, unsupervised. This method seems to be successful as I see more and more specimens. It may not be because of my efforts, but it's nice to think that I had something to do with it.

The other thing I've been doing is planting and replanting. I've been planting and replanting carrots, parsely, milkweed, thistle, nettle, goldenrod, walnut, lilac, sassafras, cherry, and any kinds of flowers I can get my hands on. Most of these plants, like the milkweed, thistle, and nettle, I get out of fields and woods and replant them in my yard. My favorite thing about milkweed is the way it multiplies. You may plant one plant in a given area and the next season when they come up there will be about three more. The only problem I found with thistle is that they are the hardest plants to handle--they are all covered with sharp prickles--even the roots! I remember the first thistles I brought home. Their flowers were exposed as I carried them and skippers and bees kept landing on the flowers! Little by little my yard is filling up with flowers for adult butterflies and leaves for the larvae. Luckily, my parents don't mind that I'm converting the yard into a small jungle.

I can't think of anything more important than the conservation of insects and the things I've mentioned are so easy to do. So if you rear specimens, don't be selfish, let what you don't need go--don't put them in paper envelopes, stored away, where you'll forget about them and where nobody can appreciate them. If you have unused space in your yard and some extra time, plant some flowers and foodplants. And better yet, if you have the influence or money--use it! As the Y.E.S. title stands for--with a positive attitude we can do anything!

## WINTER COLLECTING TIPS

William D. O'Donnell  
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Winter, with snow, sleet, rain and freezing temperatures is just around the corner. Many young insect collectors think that winter means a temporary halt to their hobby. Well, nothing could be further from the truth.

Winter insect collecting can be more difficult and challenging than summer collecting, but it can be every bit as rewarding. All insects must overwinter in one stage or another. Most spend the cold months as pupae or eggs, but others overwinter as larvae or even hibernating adults. (There are, of course, a few species that avoid winter altogether by migrating to warmer climates.) The main emphasis of winter collecting then is to know how various species spend the winter so you can know where to look. Here are a few suggestions:

1. Under rocks and debris--This is as reliable in the winter as at any other time. You may find adult ground beetles, moth larvae or pupae that you can rear out.
2. Rotten logs--A hatchet or screwdriver is useful to pry apart these insect "hotels." First look under the bark and in any attached moss before actually digging into the wood. Wood which is down and damp is generally better than dry wood. Here you may find many beetles and their larvae, springtails, spiders, centipedes, perhaps even hibernating wasp queens.
3. Standing hollow tree stumps--Prying under the bark may reveal various types of bark beetles or their tell-tale galleries. In the sheltered inside cavities you may be lucky enough to find a hibernating Mourning Cloak butterfly.
4. Bushes and tree limbs--Always be on the look-out for anything that looks like a dried leaf that just didn't fall. It may be the cocoon of a silkworm. These can also be found in the leaves that accumulate under trees, but finding them takes a lot of patient looking. A curled leaf may also hide a hibernating Viceroy larva, spider, or insect eggs. On the branches and stems you may find any type of eggs, perhaps from a mantis or a black moth.
5. Water--Aquatic insects don't seem to be affected as severely by winter as terrestrial ones. A dip net pulled through underwater debris and vegetation may pull up a wide assortment of specimens. In shallow water, and

especially streams, turn over submerged rocks while holding the net downstream. The insects will be washed into your net. A word of caution is warranted here. In the winter, ponds and streams are apt to be very, very cold. The collector must be very careful not to fall in or get wet, as death from hypothermia may be the consequence. Always work from the shore, and never venture out onto ice, regardless of how safe it appears.

6. Snow—Yes, snowdrifts harbor insects. The best time to look is in late winter or early spring while snow is on the ground and it is sunny with the air above freezing. Here you may find springtails or the wingless snow scorpionfly. These are both tiny, so pay attention to anyplace where the snow seems unusually dirty, that dirt may be insects.

These are just a few suggestions. Anyplace you can imagine is apt to harbor insects. Use your imagination. Good luck, and keep warm!

## **HIGHWAY REST AREAS: A COLLECTORS PARADISE?**

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During the summer months I do a lot of long-distance driving, for collecting expeditions, business, and hobbies. I have found that interstate highway rest areas can be a fantastic place to collect insects. You might get a few inquisitive stares, or occasionally a comment or question, but the results are usually too good to pass up because of embarrassment about collecting in a very public place. Besides, most people stopping at rest areas are in too much of a hurry to pay you any attention and watch your collecting antics. In all of the stops I have made, I have never even been questioned by patrolling law enforcement officers, so I guess the collecting activity doesn't look too illegal.

Rest areas are productive, I think, for two reasons: (1) they are brightly illuminated and (2) they are frequently located in rural (or even wilderness) areas. The collecting is always best on sultry summer nights. The best possible conditions would be a hot, humid, moonless night with a threat of thundershowers.

Some nights can be fantastic, while others are totally unproductive.

When you arrive at the chosen rest area, check around all of the lights for insects. Look on the illuminated sides of buildings and signs; check under street lights near sidewalks, parking lots, and lawns. I've even found beetles stranded in the sink basin in the rest area washroom! Be sure to check each lighted area several times (if time allows). It's a good idea to set up a systematic route from light to light, as many insects only "drop by" lights for a few moments at a time, and you need to increase your chances of being in the right place at the right time as much as you can.

Last, don't forget to check areas early in the morning. I check the exterior of rest area buildings (especially masonry cracks and eaves), sidewalk cracks, and under trash barrels and planters and have found many nocturnal insects that have sought the nearest available shelter when the sun came up.

Although I am primarily interested in the ground beetles and tiger beetles that come to rest area lights, I have seen (and occasionally collected) many specimens of interesting Lepidoptera, Neuroptera, Hemiptera, Homoptera, Orthoptera, Ephemeroptera, Trichoptera, Hymenoptera, and spiders (and their kin). So next time you're travelling, take a break and do a little collecting in a highway rest area.

## **FIREFLIES: MAGICIANS OF THE NIGHT**

**William D. O'Donnell**  
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In most of the eastern and southern United States, an early summer night just wouldn't be complete without the beautiful dancing of the fireflies.

Fireflies are one of the more intriguing insects to study. Otherwise small, non-descript beetles, their ability to produce light has attracted the attention of scientists for years. It was only in the mid-1970s that this process began to be fully understood, but a few questions still remain.

Generally, fireflies produce their flashes of light to attract mates. Each species has its own complex code of identification. This code involves such factors as the duration

and frequency of the flash and the pattern of flight of the insect. Some species, for instance, execute a "J"-shaped maneuver while flashing, while others fly in a horizontal or vertical line. This signalling is usually done by the males.

When a female of the same species sees this advertising, she may signal her readiness to mate. This is done by a similar code of light flashes. This enables the males and females to find suitable mates within their own species. The signalling is important because the females of some fireflies are wingless, and others are weak fliers. In this regard, light signalling is similar to the pheromone production which many moths use to attract mates.

Light production isn't limited to adults or to an exclusive role in mating. Firefly larvae, sometimes called "glowworms," also have the ability to produce light. Whether this larval luminescence serves any purpose, or whether it just happens to develop before it is needed is unknown. Most larvae are predatory, and it has been suggested that this helps them find or attract prey. This is highly unlikely, however.

There are, however, adult fireflies that do use their lights to capture prey. One large predatory species mimics the flash pattern of another common firefly species. Naturally, a male is attracted expecting to find a mate, but instead finds the disappointment of his life--and he is quickly devoured.

Like most insects, fireflies reach their greatest diversity in the tropics. In South America there are species, which, as larvae, have light organs all along the sides of their bodies. Others have two eye-like light organs on the back of their thorax. In Southeast Asia, fireflies are said to swarm in large numbers in trees along riverbanks. All the fireflies flash in unison, making what must be a remarkable show. Of course this is done for mating purposes and not human enjoyment, but it is no less marvelous.

As one of nature's living wonders, it is no surprise that these creatures attracted attention long before there were entomologists to study them. In Medieval Cornwall, fireflies were considered to be magically enchanted. Perhaps they were right.

## FOODPLANTS OF TWENTY FIVE NORTH AMERICAN PAPILIONIDAE

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The following is a list of 25 species of the swallowtail family (Papilionidae) and their foodplants. This foodplant list is by no means complete, but is solely a guide to breeders and rearers. In the future, I hope to make available lists of other families.

The following format is followed throughout this and subsequent lists:

Scientific name Descriptor (Common name) - foodplants

The scientific names are listed alphabetically for easy reference.

If you find any errors or would like to make contributions to future lists, please feel free to contact me.

1. Battus philenor Linnaeus (pipevine swallowtail) - wild ginger (Asarum), Virginia snakeroot, pipevine (Aristolochia serpentaria and A. macrophylla), knotweed (Polygonum), Dutchman's pipe, Aristolochia californica, and Aristolochia longiflora.
2. Battus polydamas Linnaeus (polydamas swallowtail) - pipevines (Aristolochia pentandra, A. macrophylla, A. grandiflora gigas, A. ringens).
3. Eurytides marcellus Cramer (zebra swallowtail) - papaw (Asimina triloba).
4. Eurytides philolaus Boisduval (dark zebra swallowtail) - papaw (Annonaceae).
5. Papilio anchisiades Esper (ruby-spotted swallowtail) -citrus (Rutaceae), and prickly ash relatives (Zanthoxylum).
6. Papilio aristodemus Schaus (Schaus' swallowtail) -torchwood (Amyris elemifera), and wild lime (Zanthoxylum fagara).
7. Papilio bairdii Edwards (western black swallowtail) - sagebrush (Artemesia), and dragon wormwood (Artemesia dracunculus).
8. Papilio breviceuda Saunders (short-tailed swallowtail) -cow parsnip (Heracleum), parsley (Petroselinum), angelica (Angelica), and Scotch lovage (Ligusticum scoticum).
9. Papilio cresphontes Cramer (giant swallowtail) - citrus (Rutaceae), prickly ash (Zanthoxylum americanum), hoptree (Ptelea trifoliata), gas plant, and rue (Ruta graveolins).

10. Papilio eurymedon Lucas (pale tiger swallowtail) - mountain lilac (Ceanothus), mountain balm (Ceanothus), hollyleaf cherry (Prunus ilicifolia), coffeeberry (Rhamnus californicus), alder (Alnus), buckthorn, mountain laurel, New Jersey tea, hawthorn, and currant.
11. Papilio glaucus Linnaeus (eastern tiger swallowtail) - wild cherry (Prunus), tulip tree (Liriodendron), birch (Betula), poplar (Populus), ash (Fraxinus), basswood (Tilia), willow, cottonwood (Salicaceae), maple, apple, and lilac.
12. Papilio indra Reakirt (short-tailed black swallowtail) - carrot and parsley (Apoaceae).
13. Papilio machaon Linnaeus (old world swallowtail) - parsley, parsnip, carrot, wild carrot (Daucus), and arctic sagebrush (Artemisia arctica).
14. Papilio multicaudatus Kirby (two-tailed tiger swallowtail) - cherry, hoptree, ash, privet, lilac, and shadbrush.
15. Papilio oregonius Edwards (Oregon swallowtail) - dragon wormwood (Artemisia dracunculus).
16. Papilio palamedes Drury (palamedes swallowtail) - red bay (Persea borbonia), sweet bay (Magnolia glauca and M. virginiana), and sassafras (Sassafras albidum).
17. Papilio polyxenes asterius Stoll (eastern black swallowtail) - caraway, carrot, parsley, celery, dill, wild carrot (Daucus), parsnip, Queen Anne's lace (Daucus carota), citrus (Rutaceae), rue (Ruta graveolens), and Texas turpentine broom (Thamnosma texana).
18. Papilio rudkini Comstock (desert swallowtail) - turpentine broom (Thamnosma montana), Queen Anne's lace (Daucus carota), and carrot (Apiaceae).
19. Papilio rutulus Lucas (western tiger swallowtail) - willow, poplar, hops, alder (Alnus), sycamore (Platanaceae), and aspen (Salicaceae).
20. Papilio thoas Linnaeus (thoas swallowtail) - pepper (Piperaceae).
21. Papilio troilus Linnaeus (spicebush swallowtail) - spicebrush (Benzoin), sassafras (Sassafras), sweet bay (Magnolia glauca and M. virginiana), and prickly ash (Zanthoxylum).
22. Papilio zelicaon Lucas (anise swallowtail) - anise, sweet fennel (Foeniculum vulgare), seaside angelica (Angelica lucida), cow parsnip (Heracleum lanatum), carrot and parsley (Apiaceae), and citrus (Rutaceae).
23. Parnassius clodius Menetries (clodius parnassian) - bleeding heart (Dicentra formaosa).
24. Parnassius eversmanni Menetries (Eversmanns' parnassian) - corydalis (Corydalis gigantea).
25. Parnassius phoebus Fabricius (phoebus parnassian) - stonecrops (Sedum lanceolatum and S. obtusatum) and saxifrage (Saxifraga).

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## BIOGRAPHY: WILLIAM J. HOLLAND (1848-1932)

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W. J. Holland is familiar to most entomologists as the author of The Butterfly Book and The Moth Book. Although the former was published originally in 1898, and the latter in 1903, both continue to enjoy popularity among Lepidopterists.

Few people realize that the famous entomologist was also a Presbyterian minister. His father before him had been a missionary to Jamaica, where the younger Reverend Holland was born.

The tropical climate of Jamaica held a great number of attractions for the curious young Holland. Both his parents, interested in nature themselves, actively encouraged his pursuits. In time he learned to identify, with Latin names, many of the shells, plants, and butterflies found in Jamaica.

While he was still young, his family moved to the United States, settling in Ohio. There his knowledge of plants and insects was broadened by exposure to North American species. He collected not only butterflies, but also birds, bird nests, and eggs.

His parents later moved to North Carolina, where they stayed until the Civil War broke out. During the war, the Holland family fled to the North, settling this time in

Pennsylvania. Here he entered college, learning Latin, Greek, German, French, Hebrew, Arabic, and even Japanese.

In 1891, he became Chancellor of the University of Pittsburgh. Under his direction, the University developed a great deal. He also became a confidant of Andrew Carnegie. It is therefore of little surprise that when the Carnegie Museum opened in 1898, Holland was appointed director. He resigned from the university in 1901 to devote his energies full time to the museum. He retired from the Museum in 1922 although he remained actively involved with it.

W. J. Holland, after writing two invaluable books on Lepidoptera, over 500 papers on various subjects, and stewarding one of America's great universities and museums to fame, died of a stroke in 1932.

## TRAP-NESTS FOR WASPS AND BEES

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If you've read the title and are thinking, "YUK, I don't want to have anything to do with wasps and bees because they sting." WAIT! This project is not as hazardous as you think. In fact, the bees and wasps that will make their homes in trap-nests are not likely to sting unless you pick them up. You won't have to do that--I promise. You'll just get to watch the nesting insect as she goes about her housekeeping and brood-rearing activities. Or, perhaps you'll observe the docile larvae eating and growing and turning into pupae.

All of the wasps and bees that make their nests in man-made trap-nests are solitary species rather than social species. Unlike honeybees or yellow jackets, there are no queen and worker castes among solitary species. Rather, each female makes her own nest, provisions it with food for her offspring, and lays her own eggs. In social species, the workers don't lay eggs. If one is killed while defending the colony, no matter. The queen will lay more eggs and keep the colony alive. The workers of social insects can be aggressive and will attack any perceived threat, including people. But the solitary species can't afford to take risks, because if a solitary female is killed, she can't lay any more eggs. Solitary bees and wasps prefer to

keep out of your way rather than sting you and risk being fatally swatted in the process.

So, now that you're no longer afraid of them, what's so interesting about these solitary bees and wasps? They are easy to attract to homes that you build, and their nests and nesting behavior are fun to watch. The species that use trap nests normally make nests in tunnels in dead logs or in old barn boards and other such places. The traps that you provide them are different from natural nests in that you can open them and see what has been happening inside. Mid-spring is the best time to set out trap-nests for bees and wasps because populations are rapidly expanding, but you can continue the project through summer and still find nests in July or even August.

### **Making Trap Nests**

You can use three different materials to make trap nests: straws, bamboo poles, and routed wood.

1. Straws. Buy several packages of paper or plastic straws in a variety of diameters. Different-sized insects prefer different diameter holes to make their nests in, so you may attract different species in different straws. Next, paint the tube from the center of a roll of papertowels or toilet paper with black paint. A plastic tube about the same size is better, because it will not have to be protected from water. Close one end of the tube with a piece of black-painted cardboard. The black color is necessary because the insects prefer to nest in the dark.

Choose a mixture of straws of different sizes; enough straws to fill the tube, so the straws don't shift around. Trim either the straws or the tube, whichever is larger, so that they are the same size. Dip one end of the straws in glue or rubber cement and press them against the cardboard backing of the tube so that the straws will be attached to the backing. Allow the glue to dry.

Now, wrap the tube carefully with plastic wrap or a plastic bag to keep rain from getting in. Better yet, cut a piece of plastic milk carton two or three inches longer than the tube. Glue the plastic on as a hood. Add a piece of string to the hood, and you are ready to hang your trap nests. You may want to make several tubes of straws to put in different locations.

2. Bamboo. Purchase several bamboo stakes from a garden supply store. The stakes should have holes that are between about 3/16 and 5/16 inches in diameter. Unpainted stakes are preferable to painted ones, but either will do. Be sure that the stake is not splitting down the side. With a saw, carefully cut the bamboo behind every node, so that there will be pieces in a variety of lengths, each with one open and one closed end.

Discard pieces that are split, that have holes in both ends, or that have entrance holes that are too large or too small. Insects looking for nests will not like these.

Tie four to six pieces of bamboo together with string, leaving extra string for hanging the bundle of bamboo. Make several bundles for different locations.

3. Routed wood. This is the most complicated way of making trap nests, but its advantages are that the nests are reusable, and you can open each nest, examine it, and close it back up again, making it easier to rear the larvae into adults. Furthermore trap-nesting insects prefer wood traps over other types of nest material, because they are similar to natural nests.

Saw strips of 1 X 1/2 inch pine into 5 or 6 inch lengths. In each piece of wood rout a groove that is semi-circular in cross-section, 3/16, 1/4, or 5/6 inches wide, and half that width deep. The groove should end about 3/4 of an inch from one end of the wood.

For each trap nest, you will need two pieces of routed wood of the same diameter. Put the pieces together like a sandwich, so the groove makes a deep tunnel, closed at one end. Hammer two thin nails at two corners of the nest, positioned to miss the tunnel to hold the nest together. Use black electrical tape to seal the crack between the two pieces of wood, so no light gets in. Four to six of these nests can be tied together in a bundle, like the bamboo.

### **Placing Your Trap Nests**

The wasps and bees that will use your trap nests usually nest in holes in dead wood. So it is best to put trap nests where the insects will already be looking for nesting sites: on a nail next to an old garage or shed, on a branch of a recently felled tree, near a wood pile, even on a branch of a live tree. Edges of woods, where the trees abut a field or meadow, are the best places. Bees and wasps like to be close to wildflowers, too, because they are good sources of nectar for food. A few trap nests near your vegetable garden may be nice, because the wasps will remove garden pests such as caterpillars and aphids, and the bees may help keep your bean and squash flowers pollinated!

### **Watching Nesting Behavior**

After you have found a good place to hang your trap nests, check them at least once a week to see if anyone has started using them. Sometimes the nest-maker will already be finished when you arrive. You will know because there will be a plug of

mud or leaves over the opening to one of the nests. You may be able to look down in some nests and see that they are partially completed. Or you can take a thin twig or a stiff blade of grass, and poke it into the holes. If a barrier prevents the twig from reaching the back of the tunnel, there is a good chance that someone has started to make a nest. If she's at home, she will let you know by buzzing loudly. If no one is home, wait awhile and see if she returns.

If you are patient, and if the weather is good, you may be able to watch the nest-maker at work. Get a watch or clock and see how long she stays away from the nest. Is she gone for only a few minutes, or does she stay away for an hour or more? When she enters her nest, how long does she stay? Can you tell if she brings anything with her such as mud, a piece of leaf, pollen under her abdomen (she's a bee!) or an insect between her legs (she's a wasp!)? Which way does she enter the nest? Bees, if their nests are just the same size as their bodies, may enter backwards to clean the pollen off their abdomen, then come out, turn around, and go back in head first to mix nectar with the pollen.

The nest-maker may work for several days in one nest tunnel, making a new cell for another offspring each day. When she has filled the space, or when she has made as many cells in this nest as she desires, she will plug it with the same material that she uses to separate the cells of each offspring: mud for most wasps, leaves for most bees. She may start a new nest if there is another trap of the appropriate diameter in your bundle. At this point you may wish to remove the finished nest from the bundle and put an empty one in its place.

Now comes one of the most interesting parts of your study. What's inside? If the nest is a straw, use a sharp knife to carefully cut away a piece of the straw to look inside. If the nest is bamboo, split it open with a hammer and chisel, taking care not to let the chisel smash the nest contents. If the nest is in wood, remove the tape and pull out the nails holding the two halves together.

What did you find inside? How many cells did the nest-maker leave behind? How are they made? If they are made of leaves, you should be able to carefully separate a series of cup-shaped cells stacked one inside the other. Pull the cap off some of these "cups" to see the larvae and pupae inside. Wasps, and some bees will only have partitions between cells, not a full lining on the sides. Are there larvae, pupae, or adults in the cells? What kind of food are the larvae eating? Are all of the cells the same size? Can you tell which larvae are older? Where are the older larvae placed in the nest and where are the younger larvae? When the pupae are full grown and turn into

adults, how do you suppose they get out of the nest without crawling all over each other? How do they know which way they have to go to get out of the nest? Answer as many of these questions as you can for the completed nests. Then you may wish to put the pupae and large larvae that have finished eating their food stores into a piece of straw or bamboo, or back into their cells in the wood traps. If you are lucky, perhaps some of them will metamorphose into adults in the next few weeks.

### Who Will Use the Trap Nests?

The most common bees to nest in your trap nests will be members of the family Megachilidae. These bees are usually hairy and gray, black or bluish-black, sometimes with white stripes on the abdomen. They range from a bit smaller than honeybees to a bit larger. All of them collect pollen in hairs under their abdomen. If you are able to observe the female while she makes her nest, you may see her return to her nest with her pollen-collecting hairs all yellow, but when she flies out of the nest after leaving the pollen behind, her abdomen will be black.

There are two main genera of Megachilid bees that you may find in your nests. Members of the genus Megachile make small cups lined with leaves, separated from each other with a cap of leaves. Members of the genus Osmia do not line the entire cell. Rather, they just separate cells with a partition of chewed green leaves. You will be able to see a ball of pollen and nectar sitting at the rear of each cell if the larva has not eaten it all.

Most of the wasps that you will find in trap-nests will be members of the families Vespidae, Sphecidae, or occasionally Pompilidae. They usually make partitions of mud between each cell, or sometimes of wood fragments. The vespids fill their cells with small caterpillars for their offspring. Pompilids prey on spiders, while the sphecids fill their cells with spiders, orthopterans, or hemipteran prey.

If you want to find out more about the wasps and bees that use your trap nests, here are two good books:

- Krombrin, K. V. 1967. *Trap-nesting Wasps and Bees: Life Histories, Nests, and Associates*. Smithsonian Press, Washington D.C. 570 pp.
- Andrews, Sir C. 1969. *The Lives of Wasps and Bees*. Chatto and Windus, London. 204 pp.

# ITALIAN TIGER BEETLES (COLEOPTERA: CICINDELIDAE)

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The family Cicindelidae is represented by more than 1700 species. In Italy there are 17 species of Cicindelidae including one endemic species and several endemic subspecies. This article contains information on habitats and geographical distribution of Italian tiger beetles, with illustrations and maps (Figs. 1 and 2).

## Biological Notes

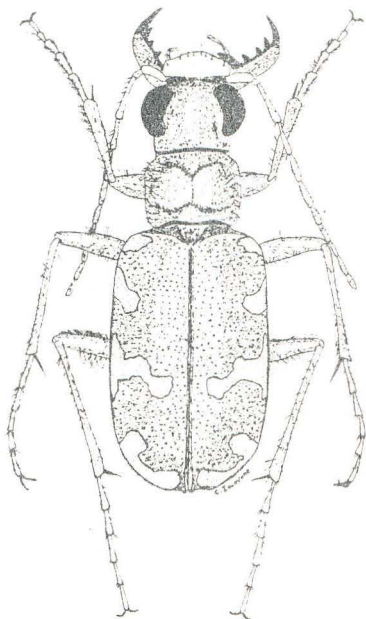
Tiger beetles are one of the most interesting families of Coleoptera. They are elegant beetles with large eyes, strong mandibles, and predaceous habits, feeding on small insects and other small animals. Most species are brilliantly colored. They are very fast; the easiest way to catch them is with a butterfly net. Many cicindelids are found in open, sandy places, such as paths, stream banks, and beaches. However, there are tropical species with arboreal habits, such as members of the Collyrinae.

The larvae of the tiger beetles have an efficient method of capturing their prey. They dig little holes in the ground, where they wait for their prey to walk by. The small humps on the fifth abdominal segment allow them to stay in their vertical tunnels (Fig. 3).

### 1. *Cicindela campestris* Linne 1758

**Distribution**—The range of this species includes all Europe, extending from Great Britain and Ireland to southern Siberia to oriental China, North Persia, Turkey, Syria, and North Africa.

Individuals of this species are among the most variable of the genus in the Palearctic zone.



*Cicindela campestris* Linne

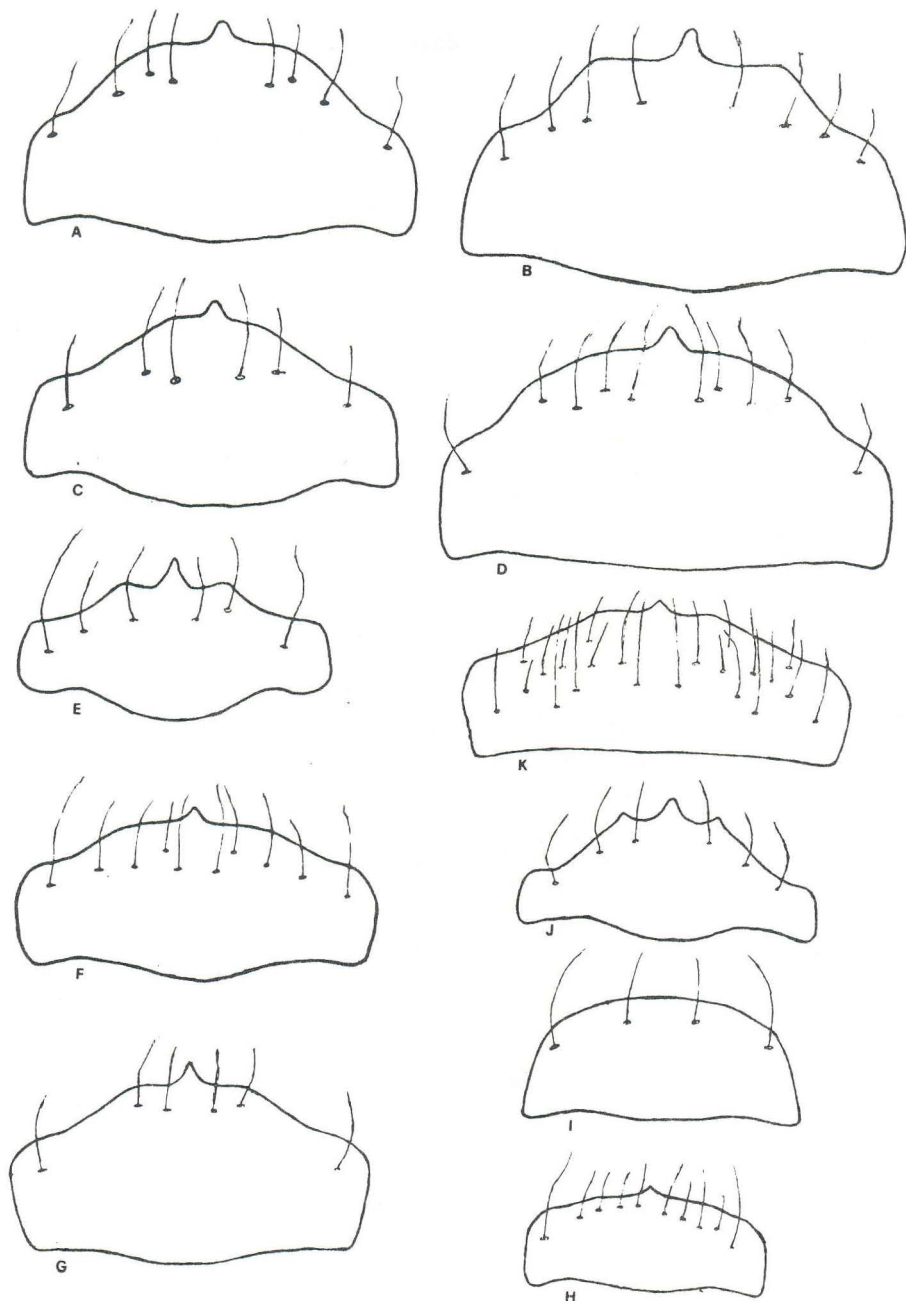


Figure 1. Diagrammatic representation of elytral patterns of: a) *Cicindela campestris campestris* L. o; b) *Cicindela silvicola* Dej. o; c) *Cicindela gallica* Brulle o; d) *Cicindela hybrida riparia* Dej. o; e) *Cylindera* (Eugrapha) *arenaria* Fuess. o; f) *Cylindera germanica germanica* L. o; g) *Cephalota litorea goudoti* Dej. o; h) *Cephalota circumdata imperialis* Klug. o; i) *Cylindera trisignata trisignata* Dej. o; j) *Myriochile melancholica* F. o; k) *Lophyra flexuosa sardea* Dej. o; l) *Lophyridia littoralis nemoralis* Dej. o.

Italy has the subspecies (Map 1): (a) ssp. campestris Linnaeus—found throughout all of continental Italy; (b) ssp. corsicana Roeschke—endemic subspecies of Sardinia and Corsica; (c) ssp. saphyrina Gene—endemic subspecies found only on the island of San Pietro (Sardinia) has bluish elytra and is one of the most beautiful cicindelids of Italy; (d) ssp. siciliana Luigioni—an endemic subspecies of Sicily; and (e) ssp. calabrica Mandl.—endemic subspecies of Calabria.

Note: The subspecific validity of ssp. siciliana and ssp. calabrica needs confirmation.

Bionomics—This common species is found in open fields, short-grass prairie and paths. It is also found at high altitudes (2000 meters above sea level).

2. Cicindela maroccana  
Fabricius 1801

Distribution—North Africa, Spain, south of France (Maritime Alps), and Italy. In Spain, France, and Italy this species is represented by the subspecies

pseudomaroccana

Roesch which is very similar to C. campestris L. and has been confused as a subspecies of campestris. In 1950, Rivalier demonstrated the differences between C. campestris and C. maroccana pseudomaroccana Roesch.

This subspecies is known only from Liguria in Italy (Cassola 1978) (Map 2), but because of the similarity with campestris, the distribution of C. maroccana pseudomaroccana must be accurately examined.

Bionomics—It prefers the same habitats C. campestris, but is rare at elevations above 500 meters above sea level.

3. Cicindela silvicola Dejean 1822

Distribution—The known range of this species extends from eastern France to northern Balkanic peninsula and Carpathians. Italy: all northern and part of central Italy (Maps) (Val d'Aosta,

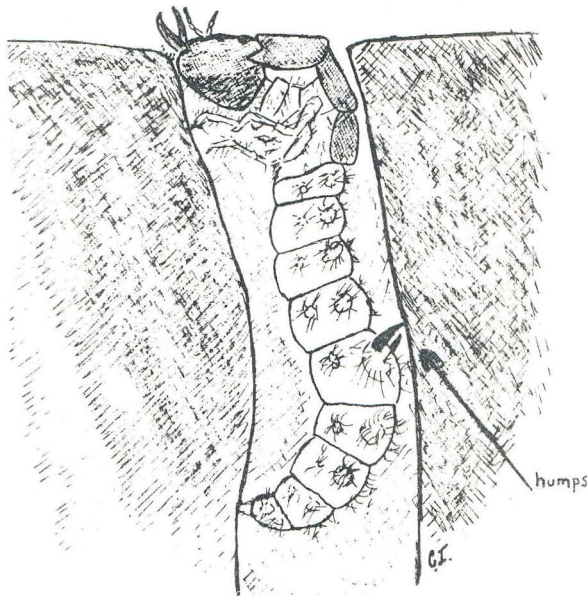


Figure 3. Tiger beetle larva in its burrow.

Piedmont, Lombardy, Trentino alto Adige, Venetia, Friuli Venezia Giulia, Liguria, Emilia Romagna, Tuscany, Latium). The presence in Tuscany and Latium are represented by old records and the presence of this species in these regions must be confirmed.

Bionomics--This species is found in mountainous and submountainous areas in open fields. It prefers sunny, sandy paths. It occurs at high altitudes (2000 meters above sea level).

#### 4. Cicindela gallica Brulle 1834

Distribution--The known range of this species extends from the Bassess Alps into Tirolo, southern Bavaria and some localities in Carinthia. In Italy, it is found in the Alps, from Piedmont to Val d'Adige (Map 2) (Val d'Aosta, Piedmont, Lombardy, and Trentino Alto Adige)

Bionomics--Most frequent in sunny grazing grounds, fields and prairies. It also occurs at high altitudes (2700 meters above sea level).

#### 5. Cicindela hybrida Linne 1758

Distribution--Euro-Asiatic species, inhabiting all of Europe and Caucasus, Turkey, Siberia, and Mongolia. In Italy, it is represented by the subspecies riparia Dejean. It occurs in part of north and central Italy (Map 4) (Piedmont, Lombardy, Val d'Aosta, Trentino Alto Adige, Venetia, Friuli Venezia Giulia, Emilia Romagna, Tuscany, and Latina)

Bionomics--Frequently found near streams at all altitudes (up to 2000 meters above sea level).

#### 6. Cicindela majalis Mandl 1935

Distribution--This endemic Italian species (Fig. 4) is found in Piedmont, Lombardy, Emilia Romagna, Marche, Abruzzo, Molise, Campania, Apulia, Basilicata, and Calabria (Map 4). It was once considered a subspecies of hybrida (Cassola 1973).

Bionomics--Same habitats as hybrida and in some regions (Piedmont, Lombardy, Emilia Romagna) it lives sympatrically with hybrida

#### 7. Cylindera germanica Linne 1758

Distribution--Middle Europe, including England and northern Spain to Balkanic peninsula, Turkey, Persia, Siberia, and China. In Italy (Map 5) there are two subspecies: (a) ssp. germanica Linnaeus--northern and central Italy (Piedmont, Lombardy, Trentino Alto Adige, Venetia, Friuli Venezia Giulia, Liguria, Emilia Romania, Tuscany, Umbria, Latium, and Abruzzo); and (b) ssp. muelleri Magistretti--South Italy (Apulia, Basilicata, Calabria and probably Sicily).

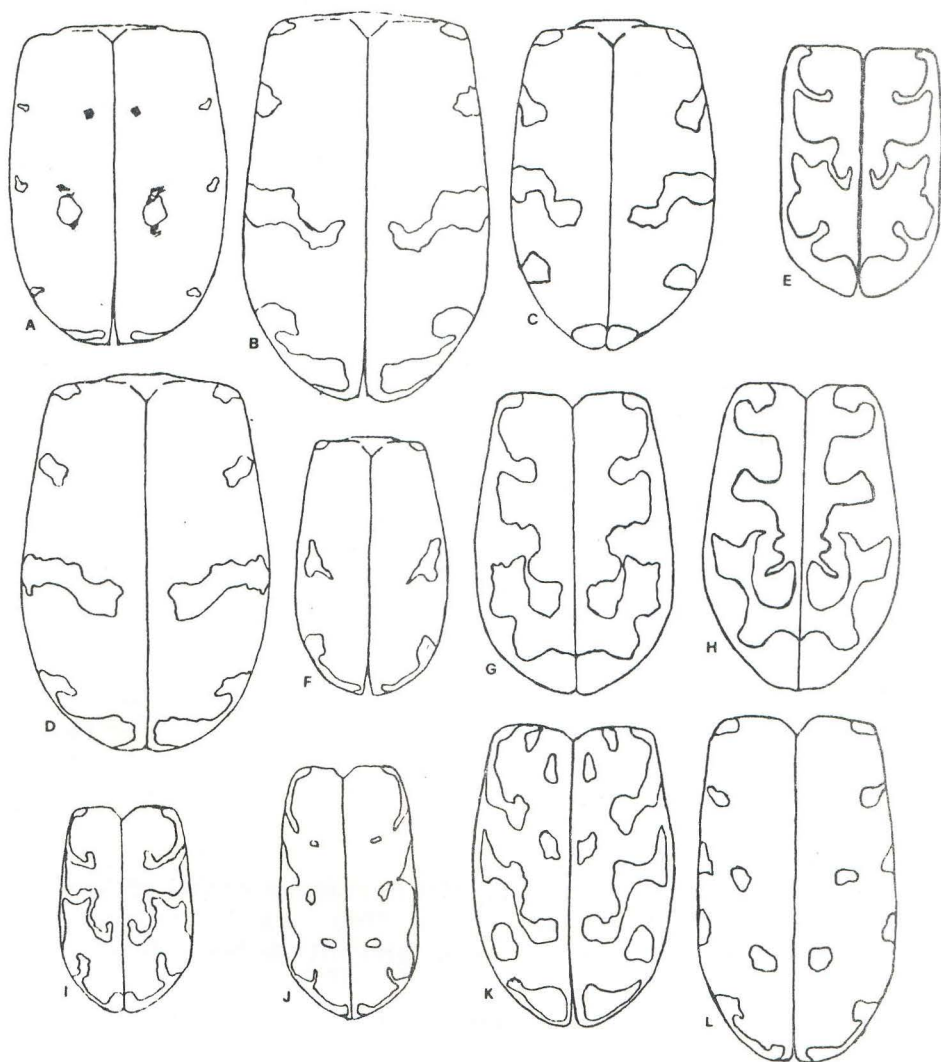


Figure 2. Diagrammatic representation of labrum of: a) Cicindela campestris campestris L. o; b) Cicindela silvicola Dej. o; c) Cicindela gallica Brulle o; d) Cicindela hybrida riparia Dej. o; e) Cylindera germanica germanica L. o; f) Cephalota litorea goudoti Dej. o; g) Cephalota circumdata imperialis Klug. o; h) Cylindera trisignata trisignata Dej. o; i) Myriochile melancholica F. o; j) Lophyra flexuosa sardea Dej. o; k) Lophyridia littoralis nemoralis Dej. o;

Bionomics--Usually found in the plains, moist fields, and glades of forests, near short vegetation.

8. Cylindera arenaria Fuesslin 1776

Distribution--Found in middle Europe from the valleys of Rhone and Rhein rivers, to Italy, Greece, and central Asia. It is widely distributed in Italy (Map 6), but seems to be absent in Sardinia. (Piedmont, Lombardy, Trentino Alto Adige, Venetia, Emilia Romagna, Tuscany, Umbria, Latium, Campania, Basilicata, and Sicily).

Bionomics--Found on sandy or clay soils near streams.

9. Cylindera trisignata Dejean 1822

Distribution--Atlantic coasts of France, southern Spain, and Morocco to Mediterranean coasts and western coasts of Black Sea. In Italy (Map 9) there are two subspecies: (a) ssp. trisignata Dejean--found in Friuli Venezia Giulia, Venetia, Emilia Romania, Tuscany, Marche, Latium, Abruzzo, Apulia, Basilicata, Calabria, and Sardinia; and (b) ssp. siciliensis Horn--found in Sicily.

Bionomics--Found on sandy sea coasts, frequently near the mouths of rivers.

10. Spiralia maura Linnaeus 1758

Distribution--This species is found in southern Spain and western part of North Africa (Morocco, Algeria, and Tunisia). In Italy, it is found in South Calabria and Sicily (Map 2).

Bionomics--Common on salt flats.

11. Cephalota litorea Forskal 1775

Distribution--Southern Spain, Mediterranean coasts of North Africa and African coasts of the Red Sea. The Italian populations are assigned to ssp. goudoti Dejean--found in Sardinia and Sicily (Map 8).

Bionomics--Edges of salty lakes; anywhere the soil has high salinity.

12. Cephalota circumdata Dejean 1822

Distribution--The known range includes southern Spain, Algeria, Tunisia, Greece, and Turkey. In Italy (Map 7) there are 3 subspecies: (a) ssp. circumdata Dejean--found along the coasts of Golfo di Taranto (Apulia, Basilicata, Calabria); (b) ssp. imperialis Klug--Sardinia and Sicily; and (c) ssp. leonschaeferi Cassola--originally known only from southern coasts of Franco, but also has been found in Tuscany (Cassola 1972).

Bionomics--Lives in the same habitats of Cephalota (Taenidia) litorea Forsk.

13. Myriochile melancholica Fabricius 1798

Distribution--Found in southern Europe, all Africa and Madagascar into Western Asia including India. In Italy, it is found in Tuscany, Latium, Apulia, Calabria, Sicily, and Sardinia (Map 10).

Bionomics--On clay soils, near streams and also in salt flats.

14. Lophyra flexuosa Fabricius 1787

Distribution--Atlantic/Mediterranean distribution: found in France, Spain, Italy, Morocco, Algeria, Tunisia, Libya, and Egypt. In Italy (Map 11) there are 3 subspecies: (a) ssp. flexuosa Fabricius--known only from Liguria (This record is doubtful and needs confirmation); (b) ssp. sardea Dejean--endemic subspecies of Sardinia; and (c) ssp. circumflexa Dejean--endemic subspecies of Sicily.

Bionomics--Sandy soils, near streams and pools.

15. Lophyridia littoralis Fabricius 1781

Distribution--Atlantic coasts of Europe and Morocco, Mediterranean

coasts, northern Asia and China. In Italy (Map 12) it is represented by 2 subspecies: (a) ssp. nemoralis Olivier--coastal Italy (Liguria, Emilia Romagna, Venetia, Friuli Venetia Giulia,

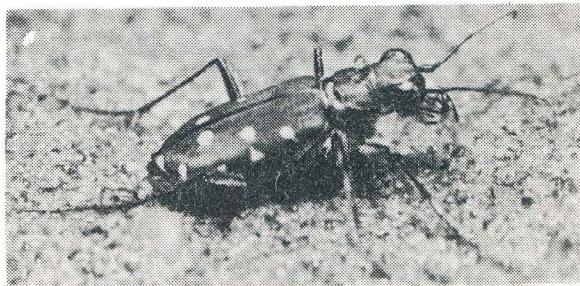


Figure 4. Cicindela majalis Mandl.

Tuscany, Marche, Latium, Abruzzo, Molise, Campania, Apulia, Basilicata, Calabria, and Sicily); and (b) ssp. fiorii Grandi--endemic subspecies of Sardinia.

Bionomics--Common on sandy beaches, especially near mouths of rivers and streams and near salt flats.

16. Lophyridia aphrodisia Baudi 1864

Distribution--Found on the coasts of Ayria, Cipro, and Rodi Island. In Italy (Map 12) there is an endemic subspecies: ssp. panormitana Ragusa which occurs only in Sicily.

Bionomics--Prefers rocky coasts.

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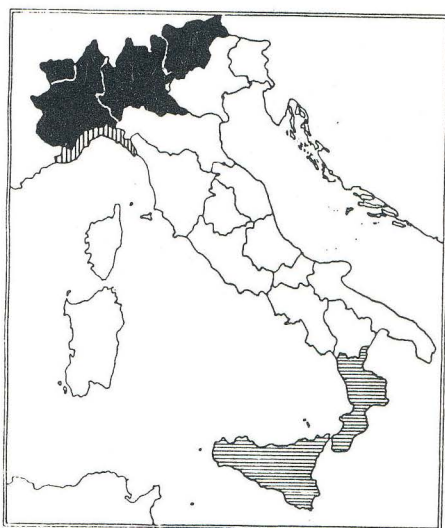
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Map 1. Distribution of *Cicindela campestris* L.

- ||||| *ssp. campestris* L.
- ==== *ssp. corsicana* Horn.
- ||||| *ssp. siciliana* Luig.
- ◆ *ssp. saphyrina* Gene
- *ssp. calabrica* Mandl.

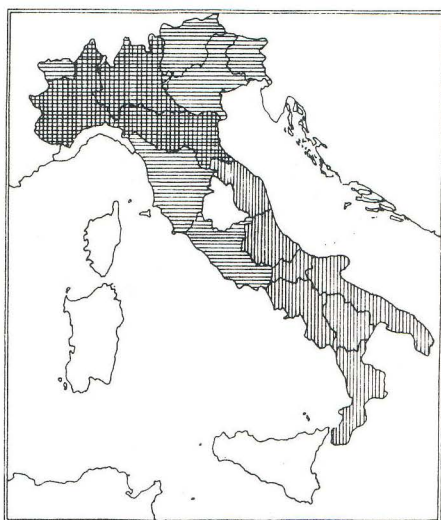


Map 2. Distribution of *Cicindela gallica* Brull., *Spirania maura* L. and *Cicindela maroccana* ssp. *pseudomaroccana* Roesch.

- *Cicindela gallica* Brull.
- ||||| *Spirania maura* L.
- ||||| *Cicindela maroccana* ssp. *pseudomaroccana* Roesch.

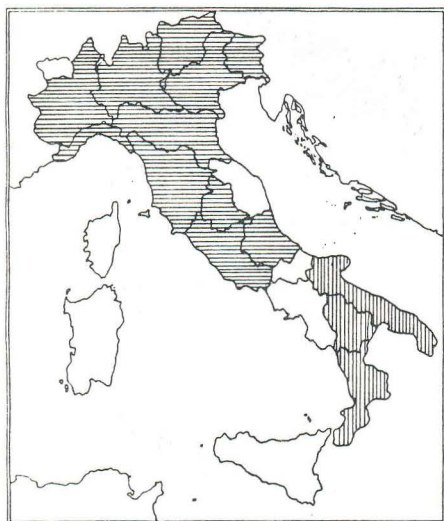


Map 3. Distribution of *Cicindela silvicola* Dej.

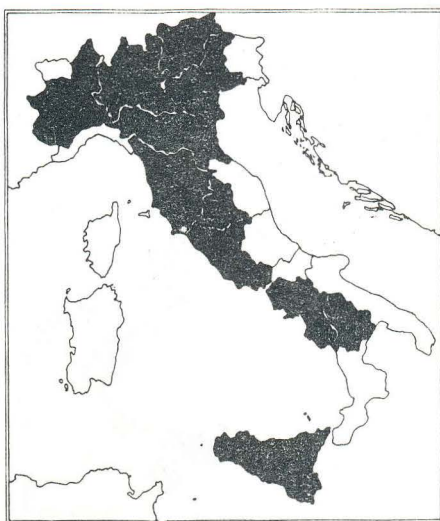


Map 4. Distribution of *Cicindela hybrida riparia* Dej. and *Cicindela majalis* Mandl.

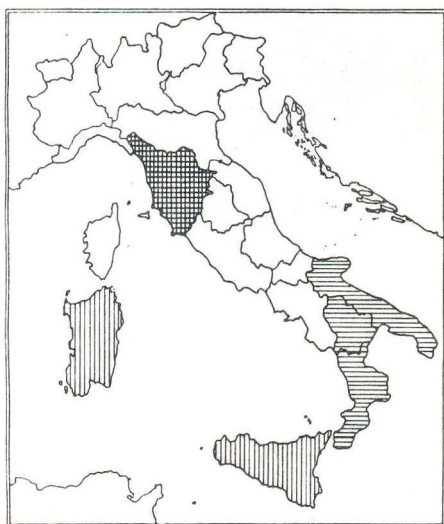
- ==== *C. hybrida riparia* Dej.
- ||||| *C. majalis* Mandl.



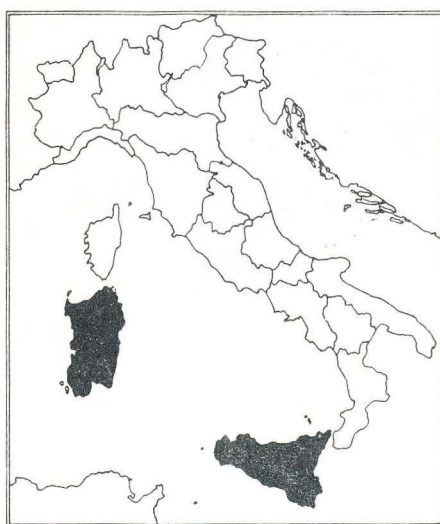
Map 5. Distribution of *Cyllindera germanica* L.  
 ≡ ssp. *germanica* L.  
 ||| ssp. *muelleri* Mag.



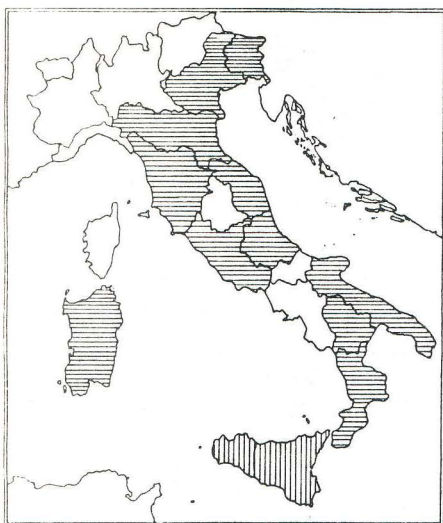
Map 6. Distribution of *Cyllindera (Eugrapha) arenaria* Fuesslin



Map 7. Distribution of *Cephalota (Taenidia) circumdata* Dej.  
 ≡ ssp. *circumdata* Dej.  
 ||| ssp. *imperialis* Klug  
 ▦ ssp. *leonschaeferi* Cass.



Map 8. Distribution of *Cephalota (Taenidia) litorea goudoti* Dej.



Map 9. Distribution of *Cyllendera trisignata* Dej.  
 ≡ ssp. *trisignata* Dej.  
 ||| ssp. *siciliensis* Horn



Map 10. Distribution of *Myriocheile melancholica* Fabr.



Map 11. Distribution of *Lophyrus flexuosa* Fabr.  
 ≡ ssp. *flexuosa* Fabr.  
 ≡ ssp. *sardea* Dej.  
 ||| ssp. *circumflexa* Dej.



Map 12. Distribution of *Lophyridia littoralis* Fabr. and *Lophyridia aphrodisia panormitana* Rag.  
 ||| *L. littoralis* *fiorii* Grandi  
 ≡ *L. littoralis* *nemoralis* Oliv.  
 ● *L. aphrodisia* *panormitana* Rag.

## Reviews

### Insects, Etc.

illustrated by Bernard Durin

1981. Hudson Hills Press, New York, New York

108 pp. \$50.00.

Insect and arthropod picture-books are fairly popular with publishers these days, but none of them come close to this beautiful volume. Although very short on text, the book includes a fabulous series of super-realistic insect portraits. Durin's color paintings even surpass Walter Linsenmaier's illustrations in his book Insects of the World.

The most striking aspects of Durin's paintings are their large size and extraordinary detail and accuracy. Texture and color are often very difficult to communicate in artwork and even photography, but this artist achieves superb expression of both of these qualities.

The brief text is equally colorful and informative, including background information on each insect pictured.

If there is any fault to be found in this work, perhaps it is in the relatively small number of plates (34). Also, the insects are not portrayed in a natural environment, but on a plain white page. This technique, however, draws immediate attention to the insect. Lepidopterists will be disappointed to find that no butterflies or moths are included, but Coleopterists will be impressed by the "Bounty of Beetles" represented. A cicada, yellowjacket, Euglossid bee, grasshopper, and a scorpion are among the other arthropods featured.

At fifty dollars the price may seem unreasonable, but for the entomologist who has everything, this is a priceless addition to the library. It may be obtained directly from Hudson Hill Press, Inc., 30 Rockefeller Plaza, Suite 4323, New York, NY 10112, U.S.A. For a sampling of the artwork and the text, see the November, 1981 issue of Audubon magazine, vol. 83, No. 6, pp. 97-107.

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## Trading Post

HELP AVAILABLE: To Y.E.S. members, ages 17 and up, collecting in the vicinity of Oviedo, Florida, northeast of Orlando. Housing, microscope, and library available with local Y.E.S. member. For more information, contact the Y.E.S. Trading Post.

WANTED: To exchange Scarabaeidae (especially Rutelinae and Melolonthinae) from the United States, Mexico, Central and South America. All correspondence welcomed. Delbert A. La Rue, 3894 McKenzie Street, Riverside, CA 92503.

FOR SALE: Antheraea polyphemus cocoons. Abundant supply. 80¢ includes postage; discount for large orders. Write: Jeff Miller, 550 Conifer Way, Ashland, OR 97520.

WANTED: Diapheromera femorata and Megaphasma denticrus eggs. Egg cases of Mantis religiosa, Stagmomantis carolina, and Tenodera aridifolia. Write to Jeff Miller, 550 Conifer Way, Ashland, OR 97520.

WANTED: Cocoons of any Saturniid moths. Write to: Jeff Miller, 550 Conifer Way, Ashland, OR 97520.

WANTED: Ovae and pupae of Lepidoptera, especially Saturniidae, Papilionidae, and Nymphalidae. Willing to buy. Send lists and prices to: David Albaugh, 9 Columbia Avenue, Jamestown, RI 02835 USA.

WANTED: All books, new or used, pertaining to entomology, especially, Lepidoptera, Coleoptera, Orthoptera, and general entomology. Send lists and prices to: David Albaugh, 9 Columbia Avenue, Jamestown, RI 02835 USA.

WANTED: All pairs of the following Lepidoptera: Papilio polyxenes, Papilio bairdii, Papilio zelicaon, Papilio indra, Papilio palamedes, Papilio cressphontes, Papilio glaucus (including dark female), Papilio troilus, Speyeria diana, Junonia coenia, Nymphalis milberti, Limenitis arthemis, Limenitis archippus, Limenitis weidemeyerii, Limenitis lorquini, Limenitis astyanax, Philosamia cynthia, Hyalophora gloveri, Hyalophora euryalis (rubra), Hyalophora columbia, Callosamia angulifera, Citheronia regalis, and Eacles imperialis. Send lists and prices to: David Albaugh, 9 Columbia Avenue, Jamestown, RI 02835 USA.

WANTED: Information on foodplants of Nymphalidae, Satyridae, Saturniidae, and Sphingidae for a series of articles to appear in the Y.E.S. QUARTERLY. Any contributions will be helpful and greatly appreciated. David Albaugh, 9 Columbia Avenue, Jamestown, RI 02835 U.S.A.

WANTED: Used stereo microscope for under \$100.00. Also interested in corresponding and trading with SE and SW United States, Spain, and New Guinea members. Dennis Lipinski, 1133 Wade St., Aliquippa, PA 15001, USA.

FOR SALE: Limited number of papered Papilio aristodemus ponceanus, A-1 ad A-2 quality with data. Please make offer. Also, A-1 papered S. diana, males and females. Write: Jevetta B. Florence, Rt. 2, Box 40, Cox's Creek, KY 40013, USA.

## Trading Post (continued)

WANTED: Books and literature about ants, bumblebees, wasps, hornets and bees. Search list on request. All letters answered and postage refunded. Contact: H. Thomas, Zeppelinstr. 31, CH-8057 Zurich, Switzerland.

FOR SALE: Insect Pins: Std. Black, Elephant, Stainless Steel, Minutens and Label Pins. Sizes 000 thru 7 available. For complete list write: Ianni Butterfly Enterprises, P.O. Box 81171, Cleveland, OH 44181.

FOR SALE: Worldwide collectible butterflies, beetles and rare insects, named with data. For subscription to butterfly and beetle price lists send \$5.00 to Ianni Butterfly Enterprises, P.O. Box 81171, Cleveland, OH 44181.

WANTED: Blow flies (Calliphoridae) on loan or for exchange from various regions of the U.S. (particularly the southwest), as part of a study of the distribution of these insects. All material sent will be identified and returned, except for a few specimens retained for the I.D. service. Blow flies are easily collected from raw fish or carrion baits. Send material to Donald Baumgartner, 150 S. Walnut St., Palatine, IL 60067.

TRADE: Western (Calif. & Nevada) butterflies for U.S. noctuid moths. Write for details: Ron Robertson, 362 Scenic Ave., Santa Rosa, CA 95407

FOR SALE OR TRADE: Livestock of many species of moths including H. cecropia, H. euryalis, H. gloveria, D. pholus, etc. Write for complete list: Chris Conlan, 1630 Milan Ave., South Pasadena, CA 91030.

FOR SALE: Over 10,000 butterfly specimens from Malaysia. Free list available from: Stephen R. Treadway, 202 Ridgeway Dr., Nashville, TN 37214 USA.

FOR SALE: Neotropical insects from northern Central America, or will EXCHANGE same for Catocala (Lepidoptera: Noctuidae) especially from Europe, N. Africa, USSR, Central Asia, China or Korea. Also, SELL glassine envelopes in 3 convenient sizes; take fountain pen and stamp pad ink well. Eduardo C. Welling M., Apartado Postal 701, Merida, Yucatan, Mexico.

PUBLICATIONS AVAILABLE: "Les Punaises Terrestres (Heteropteres: Geocorises) du Quebec," "Manuel d'identification des Carabidae du Quebec" and Fabriques (Journal). Write Association des Entomologistes Amateurs du Quebec, C. P. 52, Sillery, Quebec, G1T 2P7 Canada.

WANTED: Eggs, pupae or adults of Polyphemus moths for a living exhibit at community nature center. Donations gladly accepted or purchase can be arranged. Mike Koslosky, Naturalist, Sulphur Creek Nature, 1801 "D" Street, Hayward, CA 94541 USA.

AVAILABLE: 12 page catalog! For years we've supplied private collectors etc., around the world. Catalog only \$1 bill/check; monthly mailings \$6 for a year. Among our offers . . . over 40 morphoidae species, 250 European species, including rare parnassius listing. Transworld Butterfly Co. (YES), Apartado 6951, San Jose, Costa Rica, C. America.

Correspondence and exchange of specimens with young collectors interested in European Lepidoptera. Philippe Brems, 11 rue des Robiniers, 4420 Rocourt, Belgium.

## REPORT FROM Y.E.S. HEADQUARTERS

How about this? You are now reading the fourth (and final) issue of Y.E.S. QUARTERLY Volume 1 (1984). And, it's even ahead of schedule! I think everyone will agree we're off to a great start in our first year, and we look forward with anticipation to 1985.

We have been able to meet all but one of our goals (as of August) for the year. Our membership is growing steadily—we now have 236 members—but we need to distribute our brochures far and wide to attract even more members. If you need brochures, we got 'em. We have produced four superb, high-quality issues of our journal. We could use a greater diversity in authors and topics, but I am confident this will change in time. Also, we now have a Y.E.S. logo for our group. It was designed by one our members, Eric Eaton of Portland, Oregon. Thanks should go to Eric, to all of the other members that took time to send in their entries, and to the panel of 20 judges at Michigan State University. Eric will receive a 5 year free membership in Y.E.S. for his efforts. There is one goal we have not been able to achieve yet, although we are well on our way. Even with the aid of a computer we are having some difficulty getting all of your background information entered, sorted, and organized. Dana Hayakawa, one of our editors, has offered to take charge of this project, so I am certain we will see results in the near future.

I regret to announce that we are now completely out of Vol. 1, No. 1 of Y.E.S. QUARTERLY, our premiere issue. Hang on to your copy because they're going to be a collector's item! We still have an adequate supply of Vol. 1, No.s 2, 3, and 4. If you need back issues, let us know.

Dues notices for 1985 membership will be sent out in December. We look forward to your continued participation. It sure would be nice if each current Y.E.S. member could recruit a new member for 1985. Until next time, keep sending us your articles, artwork, letters, comments, and questions.

Gary A. Dunn  
Extension Specialist  
Y.E.S. Advisor

## Can You Find the Hidden Words?

C	X	B	G	S	P	M	G	S	F	E	Q	M	H	F
A	A	U	C	Z	U	A	I	A	Q	G	G	Z	Z	W
J	H	T	R	K	P	G	P	A	V	R	A	L	I	L
Q	P	D	E	Z	A	G	S	N	D	F	O	R	E	G
J	M	S	A	R	B	O	D	Z	I	H	E	T	X	S
L	Y	Y	W	I	P	T	R	Z	J	W	P	P	K	W
F	N	Q	S	Q	A	I	J	K	O	Q	R	J	A	O
I	A	D	Y	W	Y	N	L	R	F	G	R	N	O	E
Q	C	X	F	G	H	S	M	L	S	E	B	E	D	P
P	P	J	G	E	Z	T	K	S	A	W	S	R	M	O
E	W	R	X	E	A	U	K	G	I	R	J	P	T	F
D	N	R	H	O	F	E	M	X	R	J	J	Z	X	L
H	E	L	L	G	R	A	M	M	I	T	E	V	R	K
T	I	N	G	R	U	B	D	G	Q	N	D	Y	J	W
Z	N	P	L	J	Q	A	U	U	D	T	X	Q	Q	Y

The hidden words are:

larva  
nymph  
naiad  
grub  
pupa  
maggot  
wireworm  
caterpillar  
hellgrammite  
nit

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Compiled by Gary A. Dunn

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